

**Plant Propagation Protocol for *Petasites frigidus***  
**ESRM 412 – Native Plant Production**

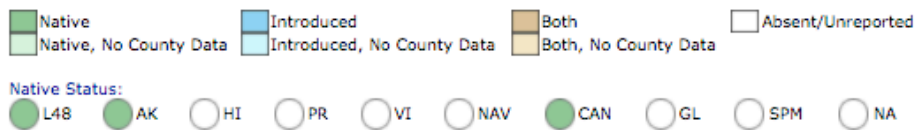
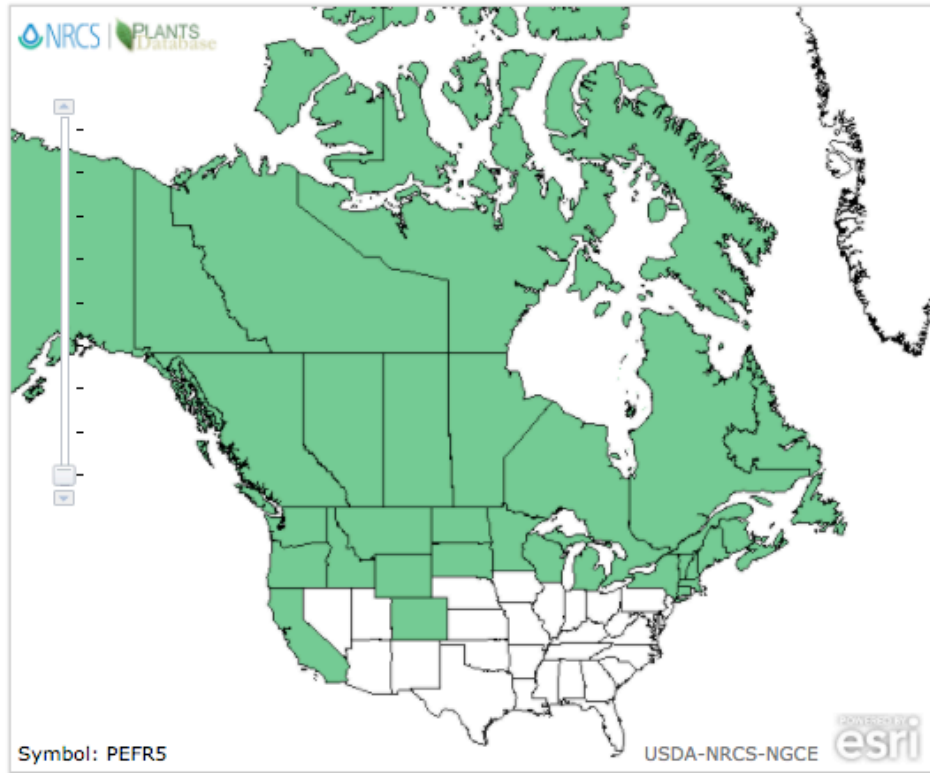
Protocol URL: <https://courses.washington.edu/esrm412/protocols/PEFR5.pdf>



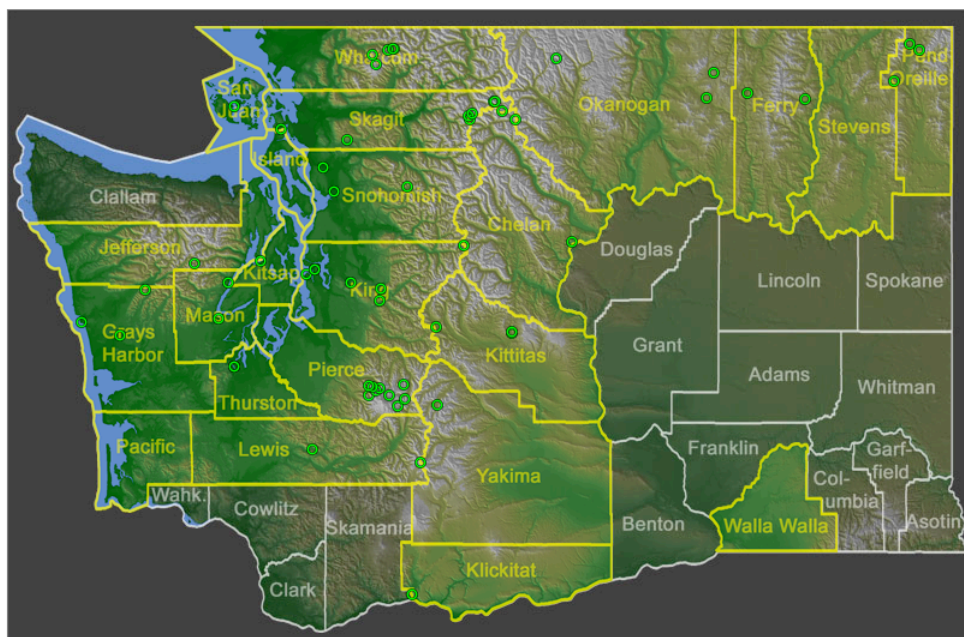
("Petasites Frigidus Var. Palmatus." 2017)

<b>TAXONOMY</b>	
<b>Plant Family</b>	
Scientific Name	Asteraceae (USDA 2017)
Common Name	Aster/Daisy/Sunflower (Plant 2017)
<b>Species Scientific Name</b>	
Scientific Name	<i>Petasites frigidus</i> (Linnaeus) Fries (USDA 2017)
Varieties	<i>Petasites frigidus</i> (L.) Fr. var. <i>frigidus</i> (Trelawny 1983) <i>Petasites frigidus</i> (L.) Fr. var. <i>palmatus</i> (Sharples 1973) <i>Petasites frigidus</i> (L.) Fr. var. <i>sagittatus</i> (Sharples 1973) <i>Petasites frigidus</i> (L.) Fr. var. <i>vitifolius</i> <i>Petasites frigidus</i> (L.) Fr. var. <i>corymbosus</i> <i>Petasites frigidus</i> (L.) Fr. var. <i>hyperboreoides</i> (Trelawny 1983) <i>Petasites frigidus</i> (L.) Fr. var. <i>nivalis</i> (Wiggins 1962) (USDA 2017) (Petasites 2017)
Sub-species	<i>Petasites frigidus</i> (L.) Fr. ssp. <i>arcticus</i> <i>Petasites frigidus</i> (L.) Fr. ssp. <i>nivalis</i> <i>Petasites frigidus</i> (L.) Fr. ssp. <i>Palmatus</i> (USDA 2017)
Cultivar	<i>Petasites frigidus</i> (L.) Fr. var. <i>palmatus</i> – Petasites 'Golden Palms' (Petasites 'Golden Palms' 2017)
Common Synonym(s)	<i>Nardosmia angulosa</i> Kuprian. <i>Nardosmia angulosa</i> Cass. <i>Nardosmia arctica</i> (A.E.Porsild) Á.Löve & D.Löve

	<p> <i>Nardosmia frigida</i> (L.) Hook.  <i>Nardosmia nivalis</i> (B.D.Greene) Jurtzev  <i>Nardosmia palmata</i> (Aiton) Hook.  <i>Nardosmia sagittata</i> (Banks ex Pursh) Hook.  <i>Nardosmia vitifolia</i> (Greene) Á.Löve &amp; D.Löve  <i>Petasites alaskanus</i> Rydberg  <i>Petasites arcticus</i> A.E.Porsild  <i>Petasites corymbosus</i> (R.Br.) Rydb.  <i>Petasites dentata</i> Blank.  <i>Petasites gracilis</i> Britton  <i>Petasites hookerianus</i> (Nutt.) Rydb.  <i>Petasites hyperboreus</i> Rydberg  <i>Petasites nivalis</i> ssp. <i>hyperboreus</i> (Rydberg) J. Toman  <i>Petasites nivalis</i> Greene  <i>Petasites palmatus</i> (Aiton) A.Gray  <i>Petasites sagittatus</i> (Banks ex Pursh) A.Gray  <i>Petasites speciosus</i> (Nutt.) Piper  <i>Petasites trigonophylla</i> Greene  <i>Petasites vitifolius</i> Greene  <i>Petasites warrenii</i> H.St.John  <i>Tussilago palmata</i> Aiton  <i>Tussilago frigida</i> L.  <i>Tussilago sagittata</i> Pursh  (Flora 2006) (USDA 2017) (Petasites 2017) </p>
Common Name(s)	<p> Arctic Sweet Coltsfoot  Arrowleaf Sweet Coltsfoot  Frigid Coltsfoot  Sweet Butterbur  Golden Palms Coltsfoot  Sweet Coltsfoot  Butterbur  Alpine Butterbur  (Robson 2008) (Anderson 1943) (Sharples 1973) (USDA 2017) (Plant 2017) </p>
Species	<p> PEFR5  (USDA 2017) </p>
<b>GENERAL INFORMATION</b>	
Geographical range	<p> Native to Alaska, Canada, and the Northern United states plus California and Colorado. (Cooke 1997) (USDA 2017) (Flora 2006) (Plant 2017) (Native 2017) (Petasites 2017) </p>



(USDA 2017)



(<http://biology.burke.washington.edu/herbarium/imagecollection.php>)

Ecological distribution	Prefers moist shaded ground, wetland, bogs, swamps, clearings, stream banks and seeping ground of cut-banks. (Flora 2006) (Pojar 2004) (Calscape 2017) Arctic tundra, moist alpine-subalpine slopes, streams, marshes, edges of moist forests, gravelly or sandy roadsides, depressions where spring run-off occurs. (Taylor, Ronald 1975) (Flora 2006) (Petasites 2017)
Climate and elevation range	Arctic to cool temperate regions of the Northern Hemisphere in northern Europe, northern Asia and northern North America (Pojar 2004) (Calscape 2017) (Native 2017)  Sub-alpine to alpine, moist woods, heaths, snow beds, moist rocks (Robuck 1989)  Elevation - 7' - 8959' (Pojar 2004) (Calscape 2017)  Zones 3b/4a-9b (Robson 2008) ("Petasites Frigidus Var. Palmatus" 2017)  Annual Precipitation: 15.3" - 119.2" Summer Precipitation: 0.18" - 3.44" Coldest Month: 29.4° F - 50.4° F Hottest Month: 47.2° F - 75.4° F Humidity: 0.01 vpd - 22.13 vpd (Calscape 2017)
Local habitat and abundance	Wetlands, stream banks, damp meadows. (Trelawny 1983) (Flora 2006) (Pojar 2004) (Calscape 2017)  Bright Shade, Dappled Shade, Mostly Shade, Shade (Robson 2008) ("Petasites Frigidus Var. Palmatus" 2017)
Plant strategy type / successional stage	Rhizomatous perennial herb (Sharples 1973) (Cooke 1997)  Spreading groundcover, can be invasive and weedy. (Anderson 1943) (Sharples 1973)  Invasive weed grows along roadsides and other disturbed sites. (Taylor 1995)
Plant characteristics	Herbaceous perennial plant producing flowering stems in early spring, and large leaves through the summer. (Anderson 1943) (Calscape 2017)  Plant Type: Perennial Habit: Spreading Groundcover Size (HT/W/FL HT): up to 24"/24"/15" Finish Time: Fast Bloom Time: April, May Growth Rate: Fast

	<p>Most Active Growing Season: Spring  Flowering Season: Spring, Winter  Flower Color: White  Special Attribute: Deer Resistant  (Anderson 1943) (Sharples 1973) (Petasites 'Golden Palms' 2017)</p> <p><b>Basal leaves</b> - blades palmately nerved, sagittate, deltate, or reniform to cordate, 2–25 × 2–27 cm, margins lobed (primary lobes 0–14, entire or dentate, secondary lobes 0–25, entire or irregularly toothed, lobed, or deeply parted, in extreme forms lobes with at least 2 lateral triangular teeth, lobes often overlapping, sinuses oblong and closed) or not lobed (dentate, teeth to 22 per side), abaxial faces floccose to woolly, adaxial faces mostly glabrous or sparsely tomentulose. (Anderson 1943)  <b>Staminate heads</b> - 2–20; ray florets 1–13, corolla laminae 1.6–12 mm; disc floret style branches 0.05–2 mm, papillate or hairy.  <b>Pistillate heads</b> - 5–19; ray florets 30–109, corolla laminae 0.8–4.8 mm; disc florets: corolla lobes 0.4–4.4 mm, style branches 0–1.2 mm, papillate or hairy.  <b>Pappi</b> - (pistillate) to 15 mm.  (Hultén 1968) (Robuck 1989) (<i>Flora of North America</i> 2006)  <b>Fruit</b> – Usually hairless achines (Taylor 1995)</p> <p>Usually dioecious, with female heads containing mainly pistillate fertile flowers, male heads containing hermaphroditic sterile flowers. (Wiggins 1962) Turner 2006)</p>
<b>PROPAGATION DETAILS – SEEDS</b>	
Ecotype	Seed collected directly from plants in and near Umiat, Alaska, 69°22'N. 152°10'W., 350' above sea-level, designated as “high arctic”* (Bliss 1958)
Propagation Goal	Plants (Bliss 1958)
Propagation Method	Seeds, available only from female plants (Robson 2008) (Bliss 1958)
Product Type	Container (Bliss 1958)
Stock Type	Transplant
Time to Grow	Seeds can be planted straight into the ground immediately after harvest. (Robson 2008)  If grown in plugs, time to transplant is unknown.
Target Specifications	Unknown
Propagule Collection	Seeds collected directly from plants in late spring/early summer (Robson 2008) and placed in glass vials or paper bags, air dried, shipped, and stored at 5°F for

Instructions	6-7 months.* (Bliss 1958)
Propagule Processing/Propagule Characteristics	Unknown
Pre-Planting Propagule Treatments	After being removed from storage, seeds are cleaned and low quality seeds discarded. In one study, seeds were placed in sterilized petri dishes, half in the light, half in the dark, between layers of moist paper and incubated at 72°.* (Bliss 1958)
Growing Area Preparation / Annual Practices for Perennial Crops	<p>Prefers moist, well-draining, humus rich soil but tolerant of many soils if they are moist, but not stagnant. (Petasites 'Golden Palms' 2017) ("Petasites Frigidus Var. Palmatus" 2017)</p> <p><b>Soil pH requirements:</b>  6.1 to 6.5 (mildly acidic)  6.6 to 7.5 (neutral)  7.6 to 7.8 (mildly alkaline)  7.9 to 8.5 (alkaline)  (PlantFiles 2017)</p> <p>Nutritional needs – 150 – 200 ppm (Petasites 'Golden Palms' 2017)</p>
Establishment Phase Details	<p>Seeds are non dormant. (Bliss 1958)  No cold stratification needed. (Robson 2008)  Germination occurs at 22 C. (Bliss 1958)</p> <p>Minimum days to germinate in the light - 3  Mean days to germinate in the light - 3  Maximum days to germinate in the light – 14  (Bliss 1958)</p> <p>Minimum days to germinate in the dark - 3  Mean days to germinate in the dark - 7  Maximum days to germinate in the dark – 21  (Bliss 1958)</p> <p>164 seeds tested with a 96% success rate when germinated in the light, and 87% success rate when germinated in the dark.*</p>
Length of Establishment Phase	Unknown
Active Growth Phase	Unknown

Length of Active Growth Phase	Unknown
Hardening Phase	Unknown
Length of Hardening Phase	Unknown
Harvesting, Storage and Shipping	Unknown
Length of Storage	Unknown
Guidelines for Outplanting / Performance on Typical Sites	<p>Prefers moist, well-draining, humus rich soil but tolerant of many soils if they are moist, but not stagnant. (Petasites 'Golden Palms' 2017) ("Petasites Frigidus Var. Palmatus" 2017)</p> <p>Nutritional needs: 150 – 200 ppm (Petasites 'Golden Palms' 2017)</p> <p>Heavy water needed (Petasites 'Golden Palms' 2017) ("Petasites Frigidus Var. Palmatus" 2017)</p> <p>Quick to flower. (Petasites 'Golden Palms' 2017)</p> <p>Spacing: 36-48 in. (90-120 cm) (PlantFiles 2017)</p>
Other Comments	* (based solely on Bliss study in 1955).
<b>PROPAGATION DETAILS – RHIZOMES</b>	
Ecotype	Anywhere plants can be found
Propagation Goal	Plants (Robson 2008)
Propagation Method	Rhizome division (Robson 2008)
Product Type	Unknown
Stock Type	Transplant
Time to Grow	Rhizome divisions can be replanted into the ground immediately after division
Target Specifications	Unknown
Propagule Collection Instructions	Rhizomes can be divided in the spring or any time of year (Robson 2008)

Propagule Processing/Propagule Characteristics	Unknown
Pre-Planting Propagule Treatments	Unknown
Growing Area Preparation / Annual Practices for Perennial Crops	<p>Prefers moist, well-draining, humus rich soil but tolerant of many soils if they are moist, but not stagnant. (Petasites 'Golden Palms' 2017) ("Petasites Frigidus Var. Palmatus" 2017)</p> <p><b>Soil pH requirements:</b>  6.1 to 6.5 (mildly acidic)  6.6 to 7.5 (neutral)  7.6 to 7.8 (mildly alkaline)  7.9 to 8.5 (alkaline)  (PlantFiles 2017)</p> <p>Nutritional needs – 150 – 200 ppm (Petasites 'Golden Palms' 2017)</p>
Establishment Phase Details	Unknown
Length of Establishment Phase	Unknown
Active Growth Phase	Unknown
Length of Active Growth Phase	Unknown
Hardening Phase	Unknown
Length of Hardening Phase	Unknown
Harvesting, Storage and Shipping	Unknown
Length of Storage	Unknown
Guidelines for Outplanting / Performance on Typical	Prefers moist, well-draining, humus rich soil but tolerant of many soils if they are moist, but not stagnant. (Petasites 'Golden Palms' 2017) ("Petasites Frigidus Var. Palmatus" 2017)



Sites	<p>Nutritional needs: 150 – 200 ppm (Petasites 'Golden Palms' 2017)</p> <p>Heavy water needed (Petasites 'Golden Palms' 2017) ("Petasites Frigidus Var. Palmatus" 2017)</p> <p>Quick to flower. (Petasites 'Golden Palms' 2017)</p> <p>Spacing: 36-48 in. (90-120 cm) (PlantFiles 2017)</p>
Other Comments	N/A
<b>INFORMATION SOURCES</b>	
References	<p>Anderson, Jacob Peter. <i>Flora of Alaska and Adjacent Parts of Canada</i>. Ames, Ia.: Collegiate, 1943. 155-56. Print.</p> <p>Biek, David, and Susan McDougall. <i>The Flora of Mount Adams, Washington</i>. Seattle, WA: Sound, 2007. Print.</p> <p>Biek, David. <i>Flora of Mount Rainier National Park</i>. Corvallis: Oregon State UP, 2000. 123-24. Print.</p> <p>Bliss, L. C. <i>Seed Germination in Arctic and Alpine Species</i>. 180-88. Print.</p> <p>Calscape.com. "Arctic Sweet Coltsfoot, Petasites Frigidus." <i>Calscape</i>. Web. 22 Apr. 2017. <a href="http://calscape.org/Petasites-frigidus-(Arctic-Sweet-Coltsfoot)">http://calscape.org/Petasites-frigidus-(Arctic-Sweet-Coltsfoot)</a></p> <p>Cooke, Sarah Spear. <i>A Field Guide to the Common Wetland Plants of Western Washington &amp; Northwestern Oregon</i>. Seattle, WA: Seattle Audubon Society, 1997. Print.</p> <p><i>Flora of North America North of Mexico. Volume 20, Magnoliophyta: Asteridae, Part 7: Asteraceae, Part 2, Asterales, Part 2 (Aster Order)</i>. New York, NY: Oxford UP, 2006. Print.</p> <p>"Flora of North America." <i>Petasites Frigidus Var. Frigidus in Flora of North America@Efloras.org</i>. Web. 22 Apr. 2017. <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=250067342">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=250067342</a></p> <p>Hall, Judy Kathryn. <i>Native Plants of Southeast Alaska</i>. Juneau, Alaska (1669 Harbor Way, Juneau 99801): Windy Ridge Pub., 1995. 47. Print.</p> <p>Hultén, Eric. <i>Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants</i>. Stanford, CA: Stanford U. 1968. 913-14. Print.</p> <p>Jolley, Russ. <i>Wildflowers of the Columbia Gorge: A Comprehensive Field Guide</i>. Portland, Or.: Oregon Historical Society, 1988. 698. Print.</p> <p>Kemper, John. <i>Wildflowers of Southern Oregon</i>. Medford, Or.: Outdoor, 2006. Print.</p> <p>Lyons, C. P. <i>Wildflowers of Washington</i>. Renton, WA: Lone Pine, 1999. Print.</p> <p>"Native Plant Network — Reforestation, Nurseries and Genetics Resources." <i>Reforestation, Nurseries and Genetics Resources</i>. Web. 21 Apr. 2017.</p>

<https://npn.rngr.net/propagation/protocols>

Parish, Roberta. *Plants of Southern Interior British Columbia*. Vancouver: B.C. Ministry of Forests and Lone Pine, 1996. 117. Print.

Peck, Morton Eaton. *A Manual of the Higher Plants of Oregon*. Portland, Or.: Binford & Mort, 1961. 829-30. Print.

"Petasites Frigidus Var. Palmatus." *Alpine Butterbur | Arctic Butterbur | Sweet Coltsfoot | Plant Lust*. Web. 22 Apr. 2017.  
<http://plantlust.com/plants/5216/petasites-frigidus-var-palmatus/>

"Petasites Frigidus." *Wikipedia*. Wikimedia Foundation, 21 Mar. 2017. Web. 26 Apr. 2017. [https://en.wikipedia.org/wiki/Petasites\\_frigidus](https://en.wikipedia.org/wiki/Petasites_frigidus)

"Petasites 'Golden Palms'." *TERRA NOVA® Nurseries - Home Gardeners - Petasites 'Golden Palms'*. Web. 22 Apr. 2017.  
<http://www.terranovanurseries.com/gardeners/petasitesgoldenpalms-p-182.html>

"Plant Database." *Lady Bird Johnson Wildflower Center - The University of Texas at Austin*. Web. 21 Apr. 2017.  
[http://www.wildflower.org/plants/result.php?id\\_plant=pefr5](http://www.wildflower.org/plants/result.php?id_plant=pefr5)

"PlantFiles: Sweet Butterbur." *Dave's Garden*. Web. 26 Apr. 2017.  
<http://davesgarden.com/guides/pf/go/80953/#b>

Pratt, Verna E. *Field Guide to Alaskan Wildflowers*. Anchorage: Alaskakrafts, 2005. 70. Print.

Pojar, Jim. *Plants of the Pacific Northwest Coast*. Place of Publication Not Identified: Partners Pub Group, 2004. Print.

Robson, Kathleen A., Alice Richter, and Marianne Filbert. *Encyclopedia of Northwest Native Plants for Gardens and Landscapes*. Portland, Or.: Timber, 2008. 282-83. Print.

Robuck, O. Wayne. *Common Alpine Plants of Southeast Alaska*. Portland, Or.: U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Research Station, 1989. 70. Print.

Sharples, Ada W. *Alaska Wild Flowers*. Stanford, CA: U, 1973. 100. Print.

Taylor, Ronald J., and George W. Douglas. *Mountain Wild Flowers of the Pacific Northwest*. Portland, Ore.: Binford & Mort, 1975. 21. Print.

Taylor, Ronald J., George Wayne. Douglas, and Gail F. Harcombe. *Mountain Plants of the Pacific Northwest: A Field Guide to Washington, Western British Columbia, and Southeastern Alaska*. Missoula, MT: Mountain, 1995. 328. Print.

Trelawny, John G. S. *Wildflowers of the Yukon and Northwestern Canada, including Adjacent Alaska*. Victoria, B.C., Canada: Sono Nis, 1983. 173-74. Print.

Turner, Mark, and Phyllis Gustafson. *Wildflowers of the Pacific Northwest*. Portland: Timber, 2006. 179. Print.

Underhill, J. E., and Diana Ottosen. *Upland Field & Forest Wildflowers*. Surrey, B.C.: Hancock House, 1986. 11. Print.

"USDA." *Plants Profile for Petasites Frigidus (arctic Sweet Coltsfoot)*. Web. 21 Apr. 2017. <https://plants.usda.gov/core/profile?symbol=pefr5>

Visalli, Dana, Walt Lockwood, and Derrick Ditchburn. *Northwest Coastal*

	<p><i>Wildflowers</i>. Surrey, BC: Hancock House, 2005. Print.</p> <p>Whitney, Stephen, and Rob Sandelin. <i>Field Guide to the Cascades &amp; Olympics</i>. Seattle: Mountaineers, 2003. Print.</p> <p>Whittlesey, Rhoda. <i>Familiar Friends: Northwest Plants</i>. Portland, Or.: Rose, 1985. 56-57. Print.</p> <p>Wiggins, Ira L., and John Hunter Thomas. <i>A Flora of the Alaskan Arctic Slope</i>. Toronto: U of Toronto, 1962. 341-42. Print.</p>
Other Sources Consulted	<p>Blackwell, Laird R. <i>Wildflowers of California: A Month-by-month Guide</i>. Berkeley: U of California, 2012. Print.</p> <p>Cooke, Sarah Spear. <i>A Field Guide to the Common Wetland Plants of Western Washington &amp; Northwestern Oregon</i>. Seattle, WA: Seattle Audubon Society, 1997. Print.</p> <p>Crawford, Victoria. <i>Wetland Plants of King County, and the Puget Sound Lowlands</i>. Seattle, WA: King County Planning Division, 1981. Print.</p> <p>Guard, B. Jennifer, John A. Christy, and Trygve Steen. <i>Wetland Plants of Oregon &amp; Washington</i>. Auburn, WA: Lone Pine Pub., 2010. Print.</p> <p>Jacobson, Arthur Lee. <i>Wild Plants of Greater Seattle: A Field Guide to Native and Naturalized Plants of the Seattle Area</i>. Seattle, WA: A.L. Jacobson, 2008. Print.</p> <p>Laurence, Jeanne. <i>An Album of Alaskan Wildflowers</i>. Seattle: Superior Pub., 1974. Print.</p> <p>Meyers, Stephen C. <i>Flora of Oregon</i>. Fort Worth: Botanical Research Institute of Texas, 2015. Print.</p> <p>Patterson, Patricia A., Kenneth E. Neiman, and Jonalea R. Tonn. <i>Field Guide to Forest Plants of Northern Idaho</i>. Fort Collins, CO: Rocky Mountain Research Station, 2004. Print.</p> <p>Pratt, Verna E., and Frank G. Pratt. <i>Wildflowers of Denali National Park</i>. Anchorage, AK: Alaskakrafts, 1993. Print.</p> <p>Pratt, Verna E. "Wildflowers Along the Alaska Highway: A Roadside Guide." <i>Barnes &amp; Noble</i>. N.p., 30 Nov. 6359. Web. 26 Apr. 2017.</p> <p>Thomas, John H. <i>Flora of the Santa Cruz Mountains of California: A Manual of the Vascular Plants</i>. Stanford, CA: Stanford U, 1975. Print.</p> <p>Underhill, J. E., and Diana Ottosen. <i>Coastal Lowland Wildflowers</i>. Surrey, B.C.: Hancock House, 1986. Print.</p> <p>White, Helen A. <i>The Alaska-Yukon Wild Flowers Guide</i>. Anchorage: Alaska Northwest, 1974. Print.</p> <p>White, Helen A. <i>The Alaska-Yukon Wild Flowers Guide</i>. Anchorage: Alaska Northwest, 1974. Print.</p> <p>Whitney, Stephen, and Rob Sandelin. <i>Field Guide to the Cascades &amp; Olympics</i>. Seattle: Mountaineers, 2003. Print.</p> <p>Whitney, Stephen. <i>A Sierra Club Naturalist's Guide to the Pacific Northwest: Oregon, Washington, Idaho, Western Montana, and the Coastal Forests of Northern California, British Columbia, and Southeastern Alaska</i>. San Francisco, Calif: Sierra Club, 1989. Print.</p>

Protocol Author	Rachel Andersen
Date Protocol Created or Updated	06/03/17

## EARLIER PROTOCOL



Photo by Brother Alfred Brousseau @ USDA-NRCS  
PLANTS Database ©St Mary's College of California

*Petasites frigidus* var. *palmatus*- Western, Sweet, or Palmate coltsfoot

Range: Native to the PNW, occurring mostly west of the Cascades. Found from Alaska to California, east to Michigan and Massachusetts. (Spear Cooke 1997)

Climate, elevation: low to middle elevations.(Pojar 1994)

Local occurrence: Common and widespread.(Pojar 1994) Especially common on sliding bluffs above Puget Sound. (Jacobson 2001)

Habitat preferences: Moist to wet forest, thickets, swamps, openings, clearings. (Pojar 1994) Full sun to part shade. (Jacobson 2001)

Plant strategy type/successional stage: Rhizomatous perennial herb. (Spear Cooke 1997)

Associated species: Not specified.

May be collected as: Seed (Baskin 2002)

Collection restrictions or guidelines: Not specified

Seed germination: Germination occurs at 22 C, seeds are non dormant (Baskin 2002)

Seed life: Not specified.

Recommended seed storage conditions: Not specified.

Propagation recommendations: Not specified.

Soil or medium requirements: Not specified.

Installation form: Not specified.

Recommended planting density: Not specified.

Care requirements after installed: Not specified.

Normal rate of growth or spread: Not specified.

#### Sources cited:

Baskin, Carol C.; Baskin, Jerry M. 2002. Propagation protocol for production of container *Petasites frigidus* (L.) Fries plants; University of Kentucky, Lexington, Kentucky. In: Native Plant Network. URL: <http://www.nativeplantnetwork.org> (accessed 17 May 2004). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.

Jacobson, A.L. (2001). *Wild Plants of Greater Seattle*. Aurthur Lee Jacobson, Seattle WA

Pojar, J., MacKinnon, A. (1994). *Plants of the Pacific Northwest Coast*. Lone Pine Publishing Vancouver British Columbia.

Spear Cooke, S. (1997). *A Field Guide to the Common Wetland Plants of Western Washington & Northern Oregon*. Seattle Audubon Society. Seattle, WA.

USDA-NRCS. 2004. **The PLANTS Database** (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

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